

Notice of Allowability

Application No.

09/598,434

Examiner

Jungwon Chang

Applicant(s)

MOORE, CHARLES ROBERT

Art Unit

2154

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to interview dated 11/17/2004.
2. ☒ The allowed claim(s) is/are 3-7,9-15,17-21 and 23, now renumbered as 1-18.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☒ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 2/6/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 11/17/2004
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


JOHN FOLLANSBEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Brian Russell, Reg. No., 40,796 on November 17, 2004.

2. The application has been amended as follows:

In claims

Claim 3 (Currently amended) A processor, comprising:

a register set;

at least one execution unit that executes load instructions to transfer data from a memory into said register set;

a load queue containing at least one entry, wherein said entry stores load data retrieved by a first load instruction; and

queue management logic that, responsive to execution of a second load instruction, detects by reference to said load queue whether a data hazard exists, and if so, outputs said load data retrieved by said first load instruction from said entry to said register set in accordance with said second load instruction [[.]], wherein said queue

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management logic, responsive to detection of said data hazard, initiates reexecution of at least said first load instruction but not said second load instruction.

Claim 8 (Canceled)

Claim 10 (Currently amended) A data processing system, comprising:

an interconnect fabric;

a memory coupled to said interconnect fabric;

a register set;

at least one execution unit that executes load instructions to transfer data from said memory into said register set;

a load queue containing at least one entry, wherein said entry stores load data retrieved by a first load instruction; and

queue management logic that, responsive to execution of a second load instruction, detects by reference to said load queue whether a data hazard exists, and if so, outputs said load data retrieved by said first load instruction from said entry to said register set in accordance with said second load instruction [[.]], wherein said queue management logic, responsive to detection of said data hazard, initiates reexecution of at least said first load instruction but not said second load instruction.

Claim 16 (Canceled)

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Claim 18 (Currently amended) A method of executing load instructions out-of-order in a processor having a register set and a load queue, said method comprising:

storing, in an entry in said load queue, load data retrieved from memory in response to executing a first load instruction;

in response to execution of a second load instruction, detecting by reference to said load queue whether a data hazard exists; and

in response to detection of a data hazard, outputting said load data retrieved by said first load instruction from said entry to said register set in accordance with said second load instruction [[.]], wherein in response to detection of said data hazard, initiating reexecution of at least said first load instruction but not said second load instruction.

Claim 22 (Canceled)

REASONS FOR ALLOWANCE

3. The following is an examiner's statement of reasons for allowance: The claimed invention provides novel use of a processor and method for detecting data hazards (i.e., out-of-order executed data receives incorrect data) and correcting the data hazards without re-executing both load instruction and subsequent dependent load instruction, results in significantly improved performance of the processor which was not taught or suggested by the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jungwon Chang whose telephone number is (703)305-9669. The examiner can normally be reached on 9:30-6:00 (Monday-Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John A Follansbee can be reached on (703)305-8498. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWC
November 17, 2004



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